Project Fact Sheet

Energy Efficient Ultra Low NO_X Burner Control Technology

GOALS

- Develop a control strategy for that will that use 25% less electrical energy in an ultra low NOx burner (ULNB) operation
- Demonstrate the technology by converting two industrial boilers

PROJECT DESCRIPTION

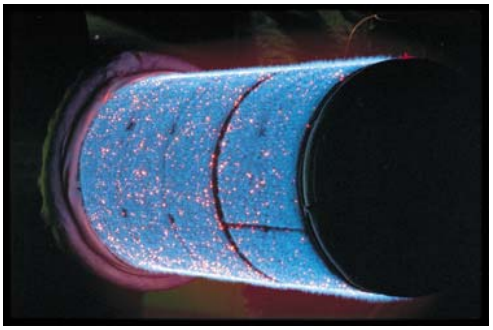
The electrical energy consumption and the cost of owning and operating boilers have increased drastically in the recent past due to more stringent environmental regulations. Typically, today's 9 ppm ultra low NOx burners require over twice the fan power that was required of previous generation 30-ppm low NO_x burners.

The generally accepted method for reducing NO_x emissions is to add excess ambient air (EAA) air or flue gas recirculation (FGR) to the burner. This additional mass has the effect of quenching or cooling the flame, which reduces the peak flame temperature and reduces NO_x formation.

The use of flue gas is preferred over the use of excess air for thermal efficiency reasons, even though more fan power is required to move flue gas through a burner. Nominally, 20% excess air or 35% flue gas recirculation is required to achieve 9 ppm emissions.

This project will demonstrate a new method of burner operation that will reduce ULNB power consumption by 25%. This concept utilizes smaller fan sized to EAA operation. It operates in FGR mode up to 82% full load and gradually moves over to EAA mode to reach full load.

A 200 hp Boiler Fitted with Control Mechanism



Cylindrical Surface Burner used in the Boiler

SITE BENEFIT

A 50 million Btu/hr boiler using this technology is expected to reduce peak demand by 18.4 kW. The system may reduce electrical energy consumption by 40,800 kWh per year, at 50% capacity operating 50% of the time. The cost of the smaller fan is expected to be $3,000 lower than the larger fan required by the alternative technology.

INDUSTRY BENEFIT

This technology could be used by 1600 boilers in the Central Valley, most operating during summer peak. The total potential peak demand reduction in the Central Valley may be 29.7 MW and 65,300 MWh per year in electricity consumption. The number of boilers includes the industrial boilers used by all industrial segments.

FUNDING AMOUNT

Project Cost: $487,000
Public Interest Energy Research Program Contribution $357,600 (78%)

FOR MORE INFORMATION

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